## CLAIMS

1. An immunoassay analyzer, comprising:

means for loading one or more samples;

means for identifying tests to be performed on each of said one or more samples, each of said tests to be performed in a test vessel;

a plurality of resources, each of said plurality of resources for performing a specified function on a test vessel, each of said tests identified by said means for identifying requiring one or more of said plurality of resources;

means for moving a plurality of test vessels to and from one or more resources of said plurality of resources; and

a computer controller which

(I) tracks a location of each test vessel;

(ii) controls movement of said test vessels by said means for moving, and

(iii) determines a path for each test vessel between each resource based on the test identified for said test vessel by said means for identifying, and the tests identified and location for all other test vessels of said plurality of test vessels, and each path requiring one or more of said plurality of resources and movement between said plurality of resources by said means for moving.

2. The immunoassay analyzer of claim 1 wherein said controller determines a launch of test sequence for each test based on samples under test and samples to be tested, said launch of test sequence controlling a time and order for tests to be launched.

3. The immunoassay analyzer of claim 2 further comprising a means for setting one or more resource saturation levels, and wherein said computer controller considers said one or more resource saturation levels in the

determination of said launch of test sequence.

4. The immunoassay analyzer of claim 3 further comprising means for modifying said one or more resource saturation levels.

5. The immunoassay analyzer of claim 4 wherein said means for modifying said one or more resource saturation levels uses historical information of tests performed previously in the immunoassay analyzer.

6. The immunoassay analyzer of claim 1 wherein said path determined by said computer controller is determined each time a new test is to be performed on said one or more samples.

7. The immunoassay analyzer of claim 1 wherein said path determined by said computer controller considers tests in one or more test vessels which are to be given priority over tests identified for all other test vessels.

8. The immunoassay analyzer of claim 3 wherein said path determined by said computer controller is determined each time a new test is to be performed on said one or more samples.

9. The immunoassay analyzer of claim 1 wherein said path determined by said computer controller reduces a total time period to perform each of the tests of each of said plurality of test vessels relative to a time period required for performing each test sequentially.

10. The immunoassay analyzer of claim 1 wherein said computer controller resolves one or more conflicts in resource allocation by selecting a group of next tests and shifting said group of next tests at least one test cycle until said one or more conflicts is resolved..

11. The immunoassay analyzer of claim 1 wherein said computer controller manages allocation of said one or more resources to balance a workload across a set of duplicate resources of said one or more resources.

12. The immunoassay analyzer of claim 11 wherein said set of duplicate resources includes duplicate wash stations.

13. A method for performing immunoassays in an immunoassay analyzer, comprising the steps of:

loading one or more samples;

identifying tests to be performed on each of said one or more samples, each of said tests to be performed in a test vessel;

moving a plurality of test vessels to and from one or more resources of a plurality of resources, each of said plurality of resources for performing a specified function on a test vessel, each of said tests identified by said means for identifying requiring one or more of said plurality of resources;

tracking a location of each test vessel;

determining a path for each test vessel between each resource based on the test identified for said test vessel by said means for identifying, said location of each test vessel, and the tests identified for all other test vessels of said plurality of test vessels, and each path requiring one more of said plurality of resources and movement between said plurality of resources; and

moving each of said plurality of test vessels along its respective path determined in said determining step.

14. The method of performing immunoassays as recited in claim 13 further comprising the step of determining a launch of test sequence for each test based on samples under tests and samples to be tested, said launch test sequence controlling a time and order of tests to be launched.

15. The method of performing immunoassays as recited in claim 13 further comprising the step of determining one or more resource saturation levels for said launch of test sequence.

16. The method of performing immunoassays as recited in claim 15 further comprising the step of modifying said one or more resource saturation levels.

17. The method of performing immunoassays as recited in claim 16 further comprising the step of using historical information of tests performed previously in said immunoassay analyzer in said modifying step.

18. The method of performing immunoassays as recited in claim 13 wherein said determining and moving step are performed so as to reduce a total time period to perform each of the tests of each of said plurality of test vessels relative to a time period required for performing each test sequentially.

19. The method of performing immunoassays as recited in claim 13 further comprising the step of resolving one or more conflicts in resource allocation by selecting a group of next tests and shifting said group of next tests at least one test cycle until said one or more conflicts is resolved..

20. The method of performing immunoassays as recited in claim 13 further comprising the step of managing allocation of said one or more resources to balance a workload across a set of duplicate resources of said one or more resources.